Yotta 3 E Series
SAS/SATA RAID Subsystem
Hardware Installation Guide

Ver: 1.4

Preface

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Notice

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Trademarks

Product names used herein are for identification purposes only and may be the trademarks of their respective companies. All trademarks or registered trademarks are properties of their respective owners.

Regulatory information

For Europe

This drive is in conformity with the EMC directive.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules.

Those limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antennas.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circlet different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

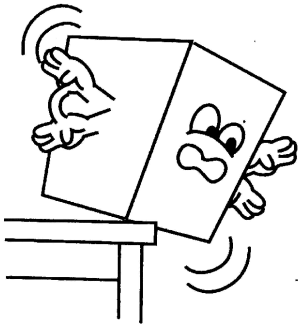
Warning:

A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

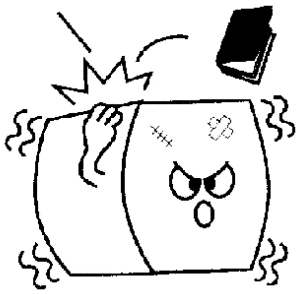
Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

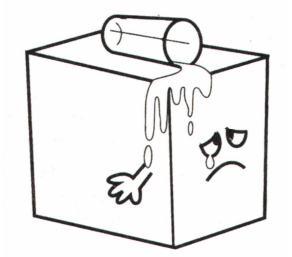
General Safety Guidelines



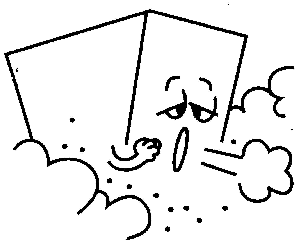
DO NOT place the RAID SYSTEM on uneven or unstable work surfaces. Seek servicing if the casing has been damaged.



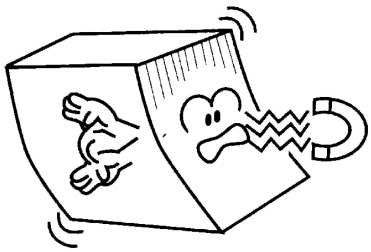
DO NOT place or drop objects on top of the RAID SYSTEM and do not shove any foreign object into it.



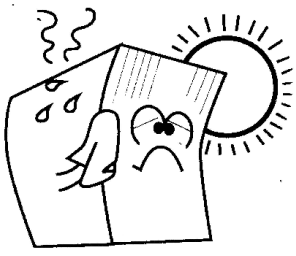
DO NOT expose RAID SYSTEM to liquids, rain, or moisture.



DO NOT expose RAID SYSTEM to dirty or dusty environments.



DO NOT expose RAID SYSTEM to magnetic field.



DO NOT expose RAID SYSTEM to extreme temperatures (below 5℃ or above 45℃) or to direct sunlight.

About your User's Guide

Welcome to your Hardware Installation Guide. This manual covers everything you need

to know in learning how to install your RAID system. This manual also assumes that you know the basic concepts of RAID technology. For the detail about how to configure your RAID system, please refer to the RAID system Software Operation manual.

Guide to conventions

Important information that users should be aware of is indicated with the following icons:

Caution

This icon indicates the existence of a potential hazard that could result in personal injury, damage to your equipment or loss of data if the safety instruction is not observed.

Note

This icon indicates useful tips on getting the most from your RAID controller.

Important terms, commands and programs are put in Boldface font.

Screen text is given in screen font.

Table of Contents

Chapter 1

Introduction

This chapter introduces the features and capabilities of RAID SYSTEM.

You will find:

- ⇨ **A full introduction to your RAID SYSTEM**
- ⇨ **Details of key features and supplied accessories**
- ⇨ **A checklist of package contents**
- ⇨ **A checklist of what else you need to start installation**

Feature Highlight

The RAID SYSTEM is designed to meet today's high volume, performance storage requirements from rapidly changing business environment. It provides a maximum data protection and exceptional performance in a storage subsystem. Target usage ranges are set from small business to departmental and corporate server needs. The RAID SYSTEM is designed for easy integration, smooth data expansion and server migration.

The RAID SYSTEM supports the following features:

Y3-12/16/24S6EPE

- LSI 800MHz RAID-on-Chip (ROC) processor
- Support cache memory size up to 4GB in DDRII-800 DIMM type with ECC registered
- Support 12/16/24 SAS 6Gb / SATA 6Gb disk channels.
- PCIe 8X Link host interface
- Support RAID level 0, 1, 10(1E), 3, 5, 6, 30, 50, 60 and JBOD
- Support global and local hot spare
- Redundant and Hot Swappable Fan, Power and Drives.
- Hot Swap, Hot Spare and Automatic Drive Rebuild Supported.
- Configuration and environmental information is accessible either via the control panel or BIOS or 10/100 Ethernet LAN port
- E-mail event notification.
- Load sharing hot swappable redundant power system with PFC function

Y3-12/16/24S6ES6

- LSI 800MHz RAID-on-Chip (ROC) processor
- Support cache memory size up to 4GB in DDRII-800 DIMM type with ECC registered
- Support 12/16/24 SAS 6Gb/SATA 6Gb disk channels.
- Dual mini SAS 4 x 6Gb SAS Ports
- Support RAID level 0, 1, 10(1E), 3, 5, 6, 30, 50, 60 and JBOD
- Support global and local hot spare
- Redundant and Hot Swappable Fan, Power and Drives.
- Hot Swap, Hot Spare and Automatic Drive Rebuild Supported.
- Configuration and environmental information is accessible either via the control panel or Serial Port or 10/100 Ethernet LAN port.
- E-mail event notification.
- Load sharing hot swappable redundant power system with PFC function
- Host System independent.
- Operating System independent.

Y3-12S6EF8

- LSI 800MHz RAID-on-Chip (ROC) processor
- Support cache memory size up to 4GB in DDRII-800 DIMM type with ECC registered
- Support 12Bay SAS 6Gb / SATA 6Gb disk channels.
- Quad 8Gb FC host interface support by 8Gb FC to SAS
- Support RAID level 0, 1, 10(1E), 3, 5, 6, 30, 50, 60 and JBOD
- Support global and local hot spare
- Redundant and Hot Swappable Fan, Power and Drives.
- Hot Swap, Hot Spare and Automatic Drive Rebuild Supported.
- Configuration and environmental information is accessible either via the control panel or Serial Port or 10/100 Ethernet LAN port.
- E-mail event notification.
- Load sharing hot swappable redundant power system with PFC function
- Host System independent.
- Operating System independent.

Before you begin

Unpacking & Checking The Equipment

Before unpacking the RAID SYSTEM, prepare a clean, stable surface to put on the contents of your RAID SYSTEM shipping container. Altogether, you should find the following items in the package:

PCIe to SAS RAID system

Y3-12S6EPE :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- PCIe 8X repeater card
- PCIe 8X to PCIe 8X Cable x 1
- Power Cord x 2
- FAN x 1
- HDD tray x 13
- Mounting screws (bag) ×1

Y3-16S6EPE :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- PCIe 8X repeater card
- PCIe 8X to PCIe 8X Cable x 1
- Power Cord x 2
- FAN x 1
- HDD tray x 17
- Mounting screws (bag) ×1

Y3-24S6EPE :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- PCIe 8X repeater card
- PCIe 8X to PCIe 8X Cable x 1
- Power Cord x 3
- FAN x 1
- HDD tray x 25
- Mounting screws (bag) ×1

SAS to SAS RAID system

Y3-12S6ES6 :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- Mini SAS to Mini SAS Cable x 1
- Power Cord x 2
- FAN x 1
- HDD tray x 13
- Mounting screws (bag) ×1

Y3-16S6ES6 :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- Mini SAS to Mini SAS Cable x 1
- Power Cord x 2
- FAN x 1
- HDD tray x 17
- Mounting screws (bag) ×1

Y3-24S6ES6 :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- Mini SAS to Mini SAS Cable x 1
- Power Cord x 3
- FAN x 1
- HDD tray x 25
- Mounting screws (bag) ×1

Fibre to SAS RAID system

Y3-12S6EF8-D :

- RAID System x1
- RAID system Hardware Installation Guide and RAID system Software Operation Manual (CD x 1)
- RS232 cable x1
- Power Cord x 2
- FAN x 1
- HDD tray x 13
- Mounting screws (bag) ×1

What else you need

- Hard disk drives (different RAID levels require different numbers of HDDs). Refer to Software Operation manual for more detail information.
- Host computer supports PCIe 8X interface (**PCIe-SAS RAID SYSTEM**)
- Host computer with SAS interface (**SAS-SAS RAID SYSTEM**)
- Host computer with Fibre interface (**Fibre-SAS RAID SYSTEM**)
- Static grounding strap or electrostatic discharge (ESD) safe work area
- Dedicated terminal or PC with third party communication software that supports ANSI terminal emulation (required for viewing Monitor Utility)

Note

The hard drives in a RAID system should match in size and speed. All drives in any array should be identical models with the same firmware versions. RAID system can use any size drive; however the smallest drive will determine the size of the array.

Note

There's no set formula to determine how much cache memory to use, but as a general rule, a workstation, with mostly very large files, such as for audio or video editing and playback, graphics or CAD files, can benefit from a large cache. File servers, with multiple random access of varying file size, generally have little or no performance improvement with additional cache.

Note

RAID system does not require the installation of different drivers for use with different operating systems. RAID system is independent and transparent to the host operating system.

Note

It is often recommended to install the hard drive with same brand, model no., interface and capacity in this RAID subsystem.

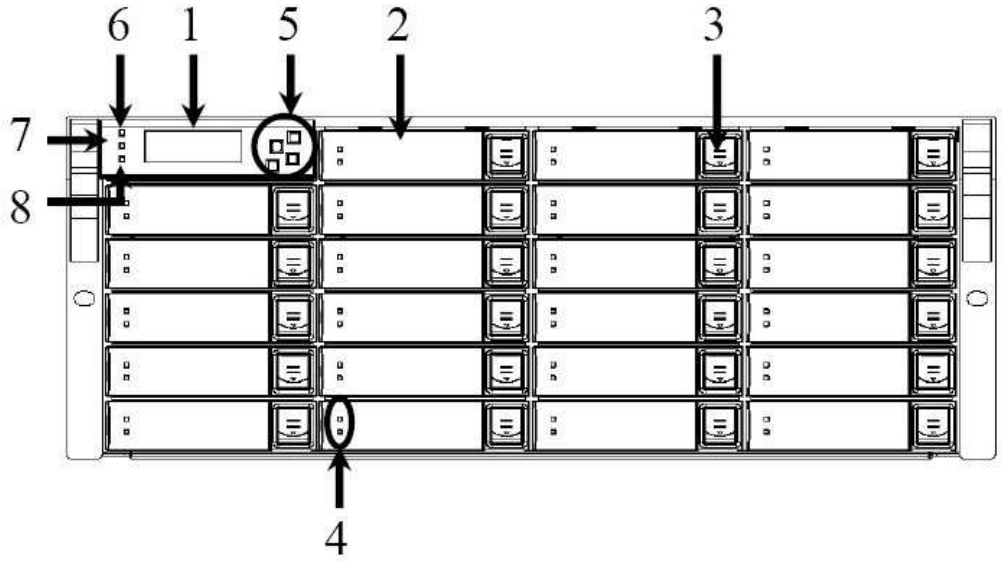
Due to hard drives spin at different speed and it may lead to compatible issue or performance decline. So we do not recommend users to install SAS and SATA hard drive meantime in an enclosure.

Identifying Parts of the RAID system

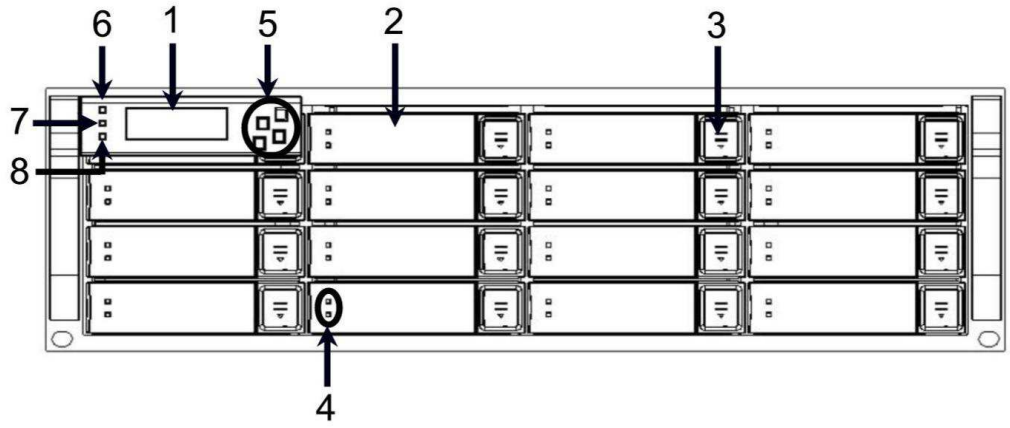
The illustrations below identify the various parts of the RAID SYSTEM. Get yourself familiar with these terms as it will help you when you read further in the following sections:

Front View

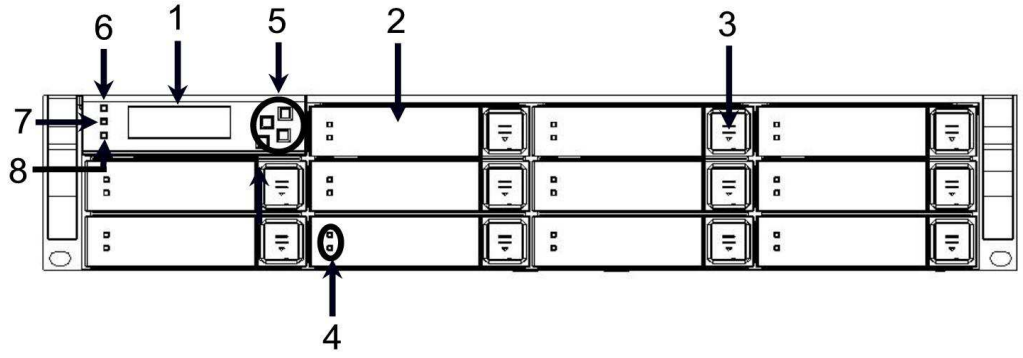
Y3-24S6EPE / Y3-24S6ES6



Y3-16S6EPE / Y3-16S6ES6



Y3-12S6EPE / Y3-12S6ES6 / Y3-12S6EF8



1. LCD Display Panel

The front panel LCD continuously displays the status of the RAID SYSTEM.

The following is an example of the RAID SYSTEM

2. Cartridge Handle

3. Lock & Release-Button

4. HDD status LED Indicator

LED	Colors	Indicate
	Blue	HDD On Line
	Blue + Blink	HDD Access
?	Red	HDD Error

5. Function keys. (ENT, ESC, Scroll up, Scroll Down)

Keys	Descriptions
Up Arrow	To scroll upward through the menu items
Down Arrow	To scroll downward through the menu items
(ENT) Enter	To confirm a selected item
(ESC) ESC	To exit a sub-menu and return to previous menu.

6.  **Power On Indicator (Blue).**

7.  **Power Fail / FAN Fail / Over Temperature Indicator (Red)**

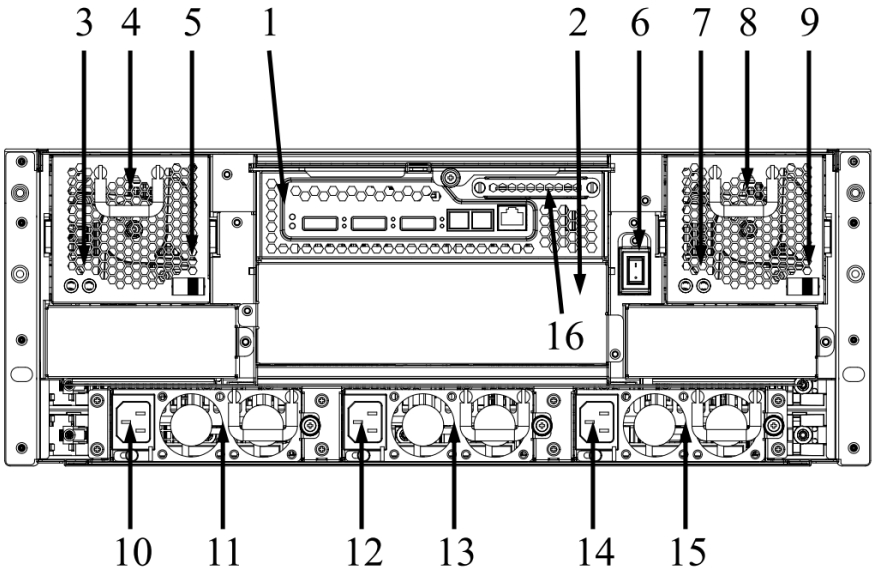
8. **A** **Host System Access Indicator (Blue + blink).**

Note

If there are SAS JBOD connected to the Raid System, Power Fail / FAN Fail / Over Temperature Indicator (Red) on LCD attached to the Raid System would only indicate events on Raid System itself. Power / FAN / Temperature indicators on SAS JBOD Enclosure would be active if events happen on SAS JBOD.

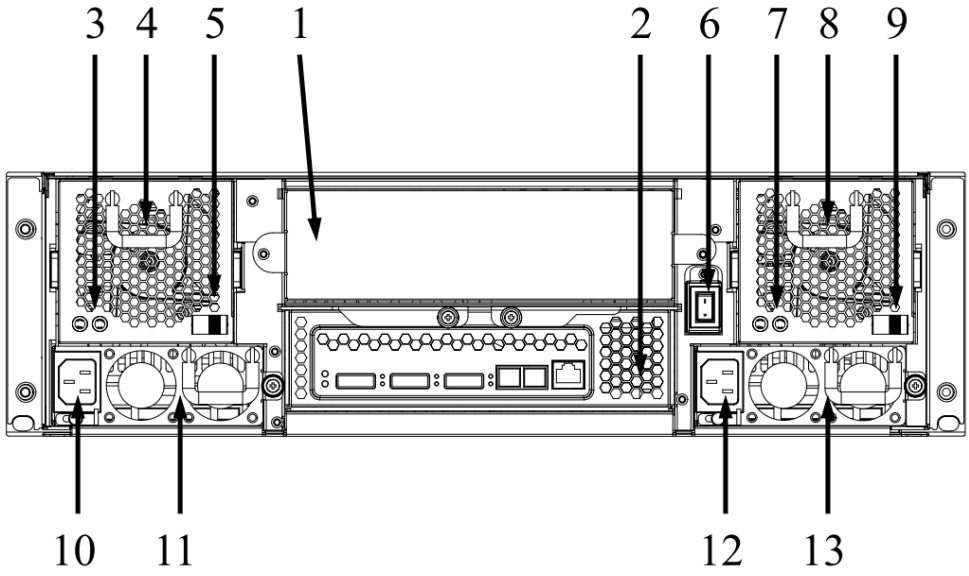
Chassis Rear View

Y3-24S6EPE / Y3-24S6ES6



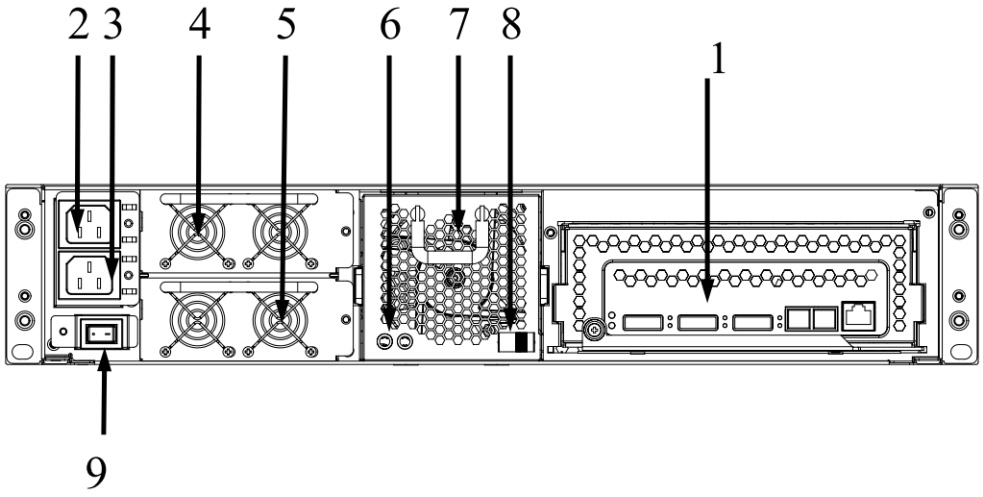
1. Controller Box 1
2. Controller Box 2 (Reserved)
3. FAN failure indicator (Rear / Front)
4. FAN Module 1
5. FAN Module 1 latch
6. Power Switch
7. FAN failure indicator (Rear / Front)
8. FAN Module 2
9. FAN Module 2 latch
10. AC inlet 1 & Latch
11. Power Module 1
12. AC inlet 2 & Latch
13. Power Module 2
14. AC inlet 3 & Latch
15. Power Module 3
16. BBM

Y3-16S6EPE / Y3-16S6ES6



1. Controller Box 2 (Reserved)
2. Controller Box 1
3. FAN failure indicator (Rear / Front)
4. FAN Module 1
5. FAN Module 1 latch
6. Power Switch
7. FAN failure indicator (Rear / Front)
8. FAN Module 2
9. FAN Module 2 latch
10. AC inlet 1 & Latch
11. Power Module 1
12. AC inlet 2 & Latch
13. Power Module 2

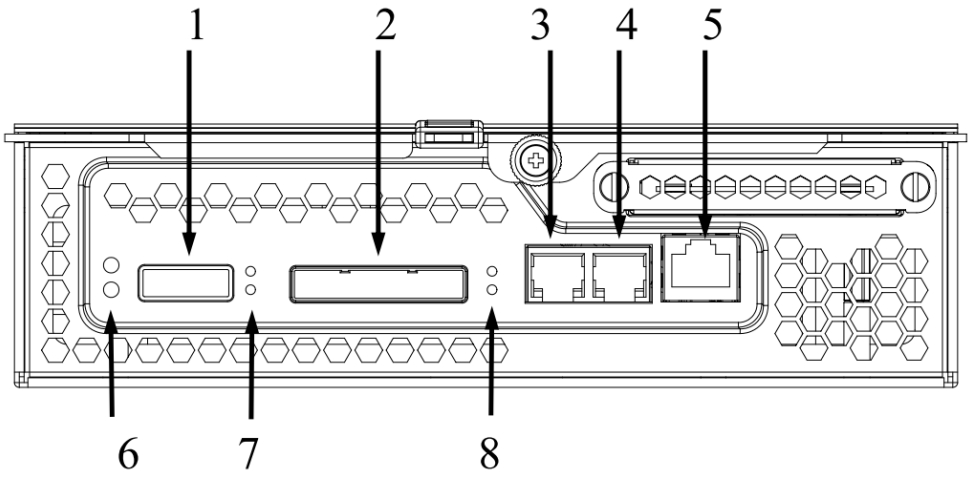
Y3-12S6EPE / Y3-12S6ES6 / Y3-12S6EF8



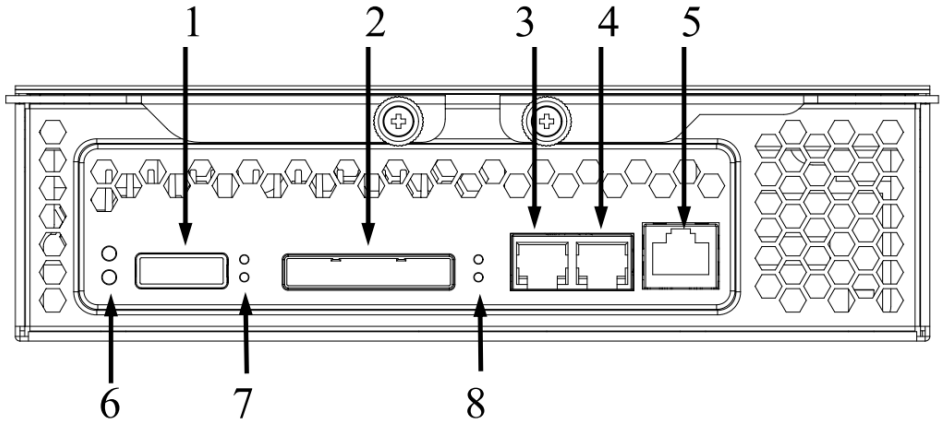
1. Controller Box
2. AC inlet 2 & Latch
3. AC inlet 1 & Latch
4. Power Module 2
5. Power Module 1
6. FAN failure indicator (Rear / Front)
7. FAN Module
8. FAN Module latch
9. Power Switch

Controller Rear View

Y3-24S6EPE



Y3-16S6EPE



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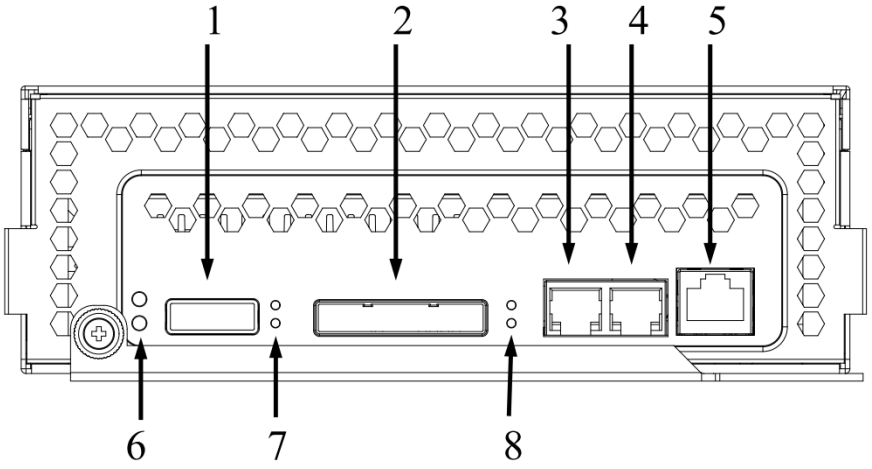


1. SAS Expand Port

2. PCIe 8x Port

3. Console

4. Terminal

5. LAN port

6. Raid Controller Status LED & Fault LED Indicator

LED	Colors	Indicate
Status	Green + Blink	Raid Controller OK
Fault	Red	Raid Controller Fault

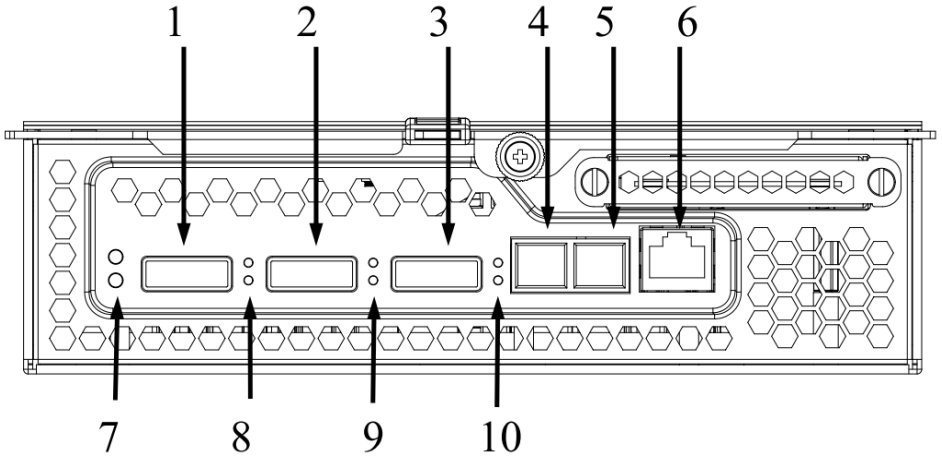
7. SAS Expand LED Indicator (Link / Access)

LED	Colors	Indicate
FC	Green	Link
	Blue + Blink	Access

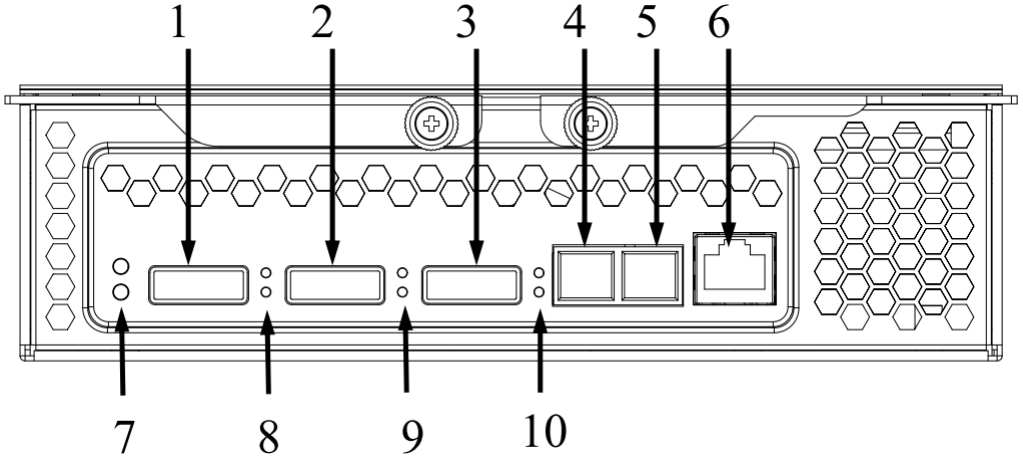
8. PCIe 8x LED Indicator (Link / Access)

LED	Colors	Indicate
Link	Green	Link by PCIe 8x Gen2
	Green 4 second on, 4 second off	Link by PCIe 4x Gen2
	Green 1 second on, 7 second off	Link by PCIe 1x Gen2
	Green + Blink (0.5 second on, 0.5 second off)	Link by PCIe 8x Gen1
	Green + Blink 4 second, 4 second off	Link by PCIe 4x Gen1
	Green + Blink 1 second, 7 second off	Link by PCIe 1x Gen1
Access	Blue + Blink	Access

Y3-24S6ES6



Y3-16S6ES6



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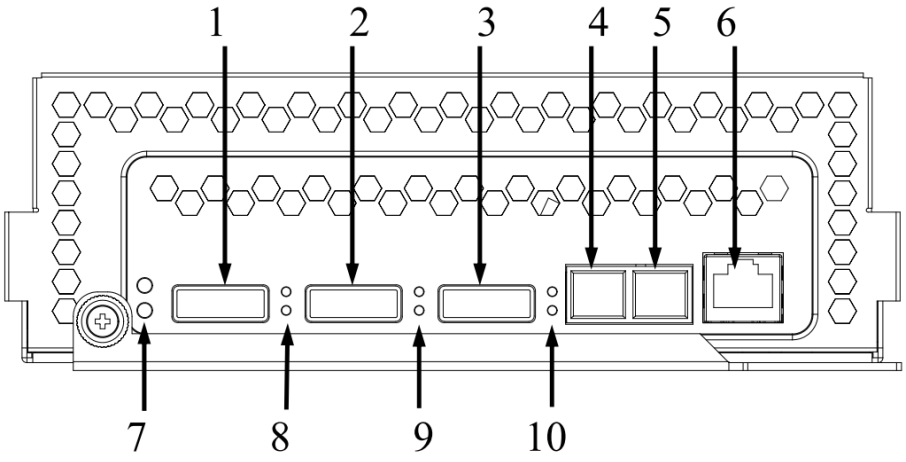


1. SAS Expand Port

2. SAS CH 1

3. SAS CH 0

4. Console

5. Terminal

6. LAN port

7. Raid Controller Status LED & Fault LED Indicator

LED	Colors	Indicate
Status	Green + Blink	Raid Controller OK
Fault	Red	Raid Controller Fault

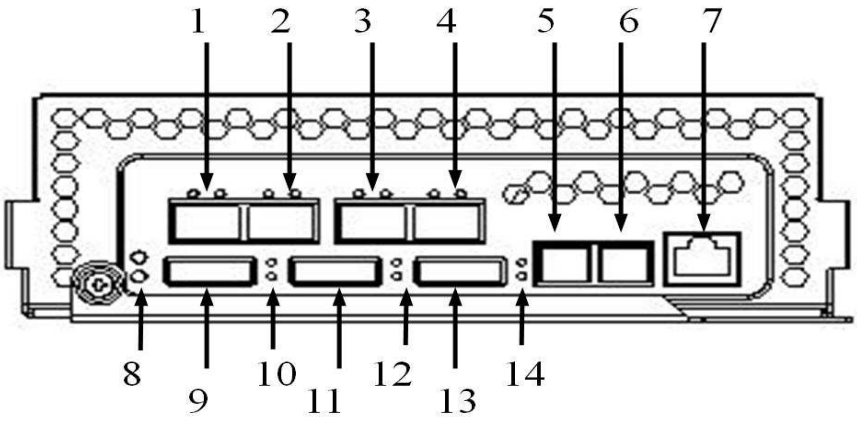
8. SAS Expand Port LED Indicator (Link / Access)

LED	Colors	Indicate
SAS	Green	Link
	Blue + Blink	Access

9. SAS CH1 LED Indicator (Link / Access)

10. SAS CH0 LED Indicator (Link / Access)

Y3-12S6EF8



1. FC CH 0 (Link & Access LED Indicator)

2. FC CH 1 (Link & Access LED Indicator)

3. FC CH 2 (Link & Access LED Indicator)

4. FC CH 3 (Link & Access LED Indicator)

LED	Colors	Indicate
FC	Green	Link
	Blue + Blink	Access

5. Console

6. Terminal

7. LAN port

8. Raid Controller Status LED & Fault LED Indicator

LED	Colors	Indicate
Status	Green + Blink	Raid Controller OK
Fault	Red	Raid Controller Fault

9. Reserved

10. Reserved Port LED Indicator (Link / Access)

LED	Colors	Indicate
SAS	Green	Link
	Blue + Blink	Access

11. SAS Expand 1 Port

12. SAS Expand 1 LED Indicator (Link / Access)

13. SAS Expand 0 Port

14. SAS Expand 0 LED Indicator (Link / Access)

Space Requirement

When selecting a location for your system, be sure to allow an adequate space. The system has vents around it which will require a minimum of 3 inches of unobstructed space for airflow. Openings in the equipment should be blocked, or there may be an issue of reliability problems with your system. A system product should never be place around a radiator or heat register.

System Connection

Connect all cables and power cord as shown below:

Cable	Raid System	Device	Purpose
RS-232 Cable	Terminal Port	ANSI Terminal or a PC with Terminal emulator.	Configuration Utility
RS-232 Cable	Console Port	ANSI Terminal or a PC with Terminal emulator.	Debug port, to check and monitoring all of status of RAID subsystem.
Mini SAS Cable	Primary SAS Secondly SAS	SAS HBA of Host computer	Host interface between RAID and Host computer
PCIe 8X to PCIe 8X Cable	PCIe 8X Connector	PCIe 8X of Host computer	Host interface between RAID and Host computer
RJ 45 Cable	Ethernet Port	Switch or HUB	Connect to Internet.
Mini SAS Cable	SAS Expander Port	Raid System	Connect to SAS Expander
Power Cord	Power inlet	A/C power outlet	A/C power input

Note

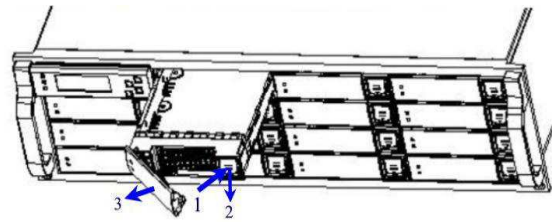
Make sure that all the devices are powered off before connecting or removing cables to prevent power spikes which can damage technical components.

Install hard disks

The RAID SYSTEM includes 12/16/24 (depending on your models) removable disk cartridges. The following sections describe how to install disks into RAID SYSTEM subsystems.

Remove Cartridges

We designed the lock/unlock mechanism on a same button and called *EzSecurLock*. No need a key but with security.

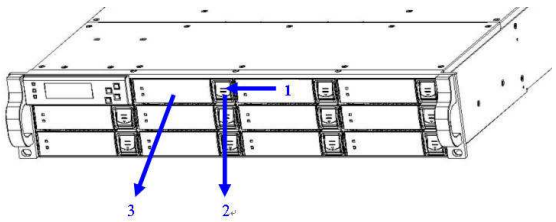


How to remove Cartridges?

1: Push the button inward

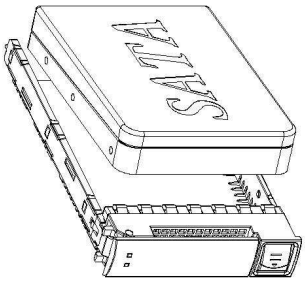
2: While holding in the button, then slide down

3: The HDD door will be opened automatically.

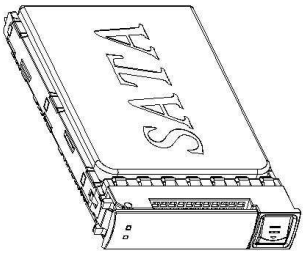


Install HDDs.

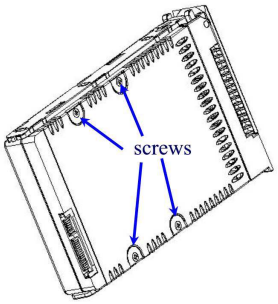
1) Put HDD into the Cartridge.



2) Align 4 screws holes on both HDD & Cartridge.

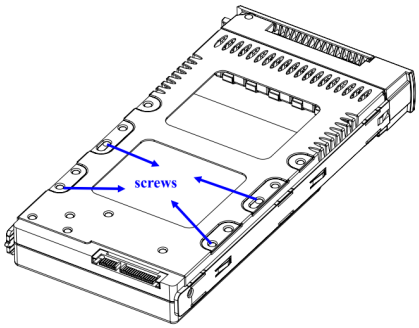


3) Fasten all 4 screws to mount HDD in the cartridge and make sure the HDD is properly tightened.

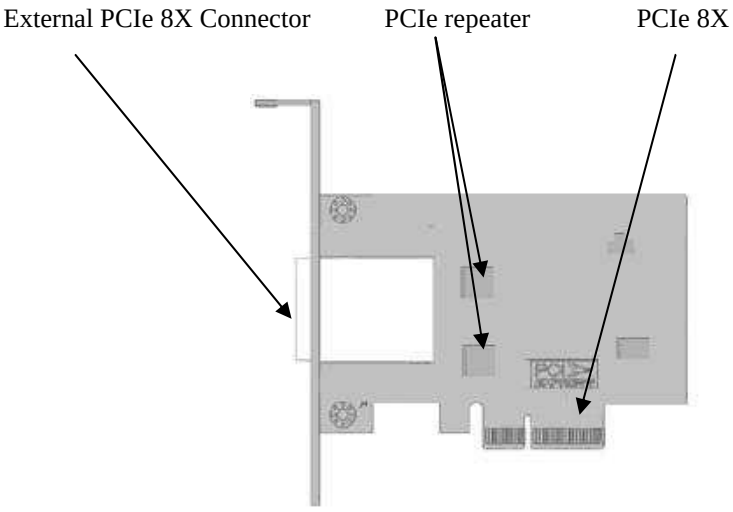


Install Cartridges

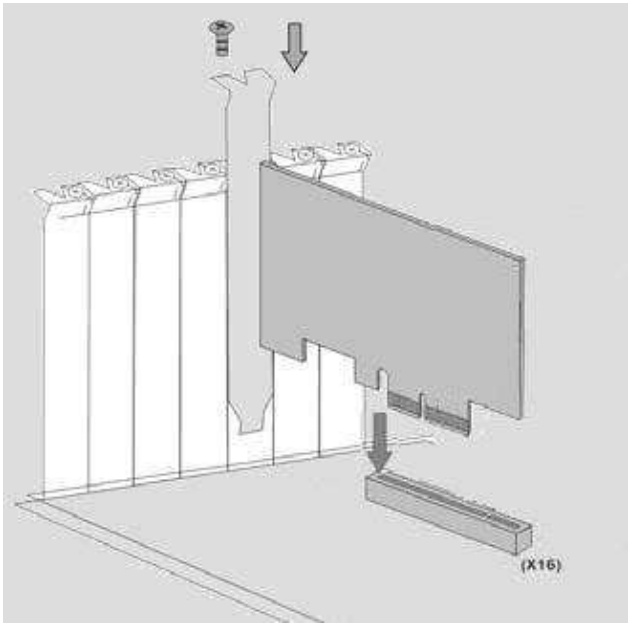
Reversed the procedures of "Remove cartridges" to install cartridges back to RAID system.



Install PCIe repeater card (For PCIe-SAS RAID only)



To install the PCIe repeater card, remove the mounting screw and existing bracket from the rear panel behind the selected PCIe slot. Align the gold-fingered edge on the card with the selected PCIe expansion slot. Press down gently but firmly to ensure that the card is properly seated in the slot. Then, screw the bracket onto the computer chassis. PCIe repeater card requires a PCIe slot supports PCIe 8X.



Chapter 2

Hardware Installation

This chapter presents:

- Instructions on replacing components
- Instructions on replacing the hot swappable components
- Instructions on how to install and upgrade DRAM

Replace the Controller

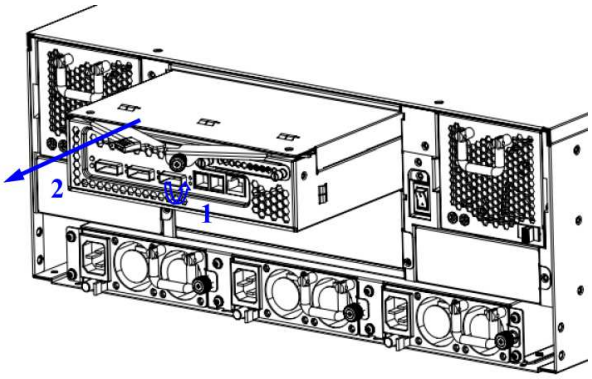
Caution

Read the replacing notices in this chapter before proceeding with replacement.

This section provides instructions for the removal and installation of the RAID controller components indicated in the figure below. This section is for the reference of engineers. End users should not need to replace or remove components.

Removing the controller from Y3-16/Y3-24 series

Y3-24S6 Series



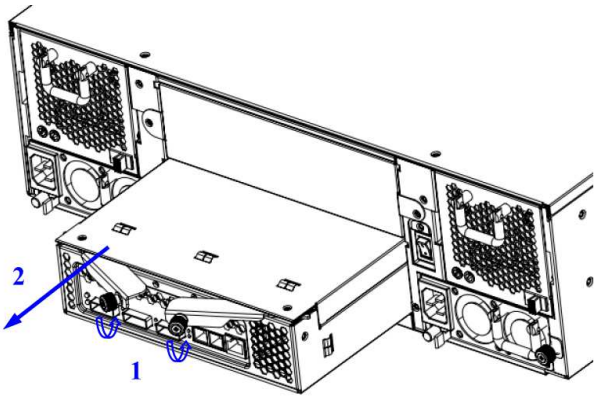
1:

1-1) Disconnect the host cables

1-2) Turn anti-clockwise to release the thumb screw.

1-3) Use the eject kit to remove controller board.

Y3-16S6 Series



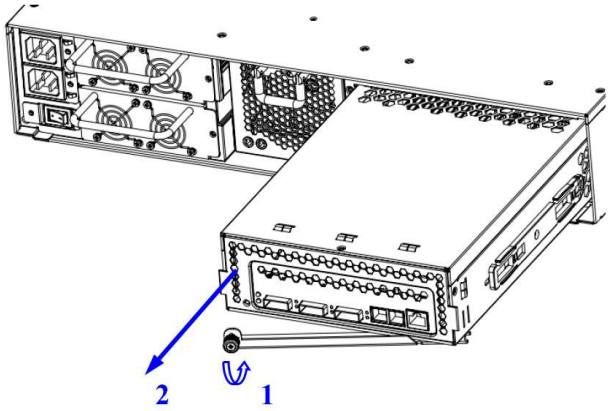
2:

Slide it back and lifting off

Installing the controller into Y3-16S6/Y3-24S6 series

Reverse the procedures as above to install the controller into Y3-16S6/Y3-24S6 series

Y3-12S6 Series



1:

1-1) Disconnect the host cables

1-2) Turn anti-clockwise to release the thumb screw.

1-3) Use the eject kit to remove controller board.

2:

Slide it back and lifting off

Installing the controller into Y3-12S6 Series

Reverse the procedures as above to install the controller into Y3-12S6 Series

Replacing / Upgrading DDRII SDRAM

Caution

Read the pre-installation notices in this chapter before proceeding with installation.

RAID SYSTEM is normally supplied with 1GB DDRII-800 SDRAM installed.

Note

There's no set formula to determine how much cache memory to use, but as a general rule, a workstation, with mostly very large files, such as for audio or video editing and playback, graphics or CAD files, can benefit from a large cache. File servers, with multiple random access of varying file size, generally have little or no performance improvement with additional cache.

Memory serves as the data buffer to increase the CPU utilization rate and minimize the overhead of data accessing, thus, improves the overall performance.

Y3-12S6/16S6/24S6 supports up to 4GB DDRII-800 DIMM type with ECC registered type memories.

The DDR memory socket is used 240-pin DDR2 DIMM socket. Use 25 degree DDR2 DIMM socket

DDRII SDRAM DIMM specifications:

Memory	
Memory type	240-pin DDR2 DIMM x 1
Memory socket type	25 degree DDR2 DIMM socket
Memory size	Up to 4GB with 64-bit DDRII-800 with ECC registered (using x8 or x16 chip organization)

Installing memory module

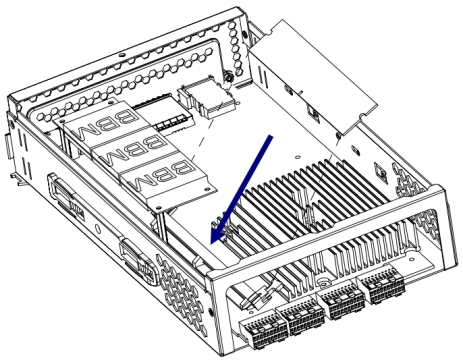
Before install a DDRII SDRAM ensures the system is power off and disconnected. Then:

1: Removing the controller module from Raid system.

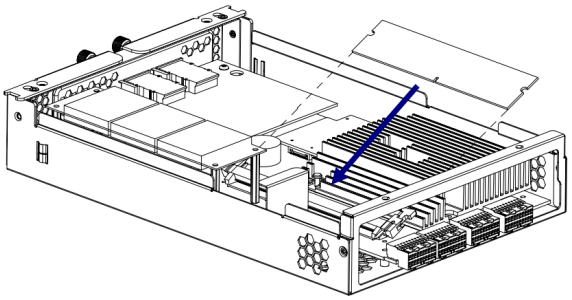
2: Open the cover of controller module.

3. Insert a memory module into the memory socket.

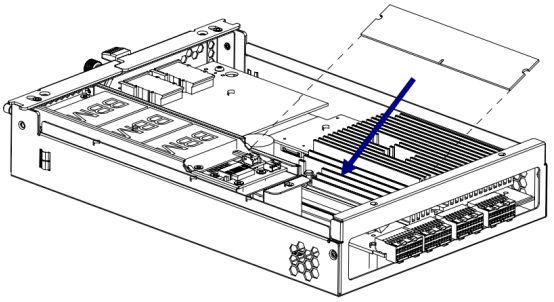
4. Close the cover of controller module.



Y3-12S6 Series



Y3-16S6 Series



Y3-24S6 Series

Caution

Before starting any kind of hardware installation, please ensure that all power switches have been turned off and all power cords disconnected to prevent personal injury and damage to the hardware

Caution

Use screws provided with RAID system only. Longer or shorter screws may cause electric shorting or un-proper installed.

Caution

Static electricity can damage electronic components. To prevent against such damage:

Work in a static-free environment

Wear a grounded anti-static wrist strap

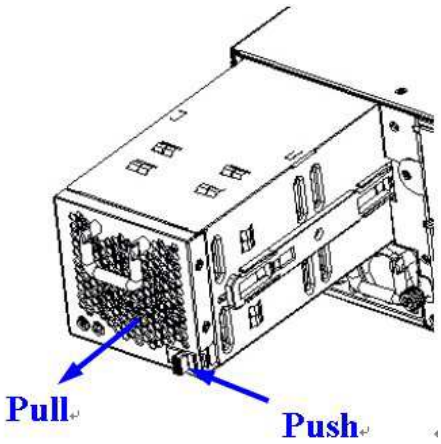
Store uninstalled components in anti-static bags

Handle PCBs by their edges and avoid touching chips and connectors.

Hot Swapping to replace the Fan Module

This section provides instructions for the removal and installation of the Fan module indicated in the figure below.

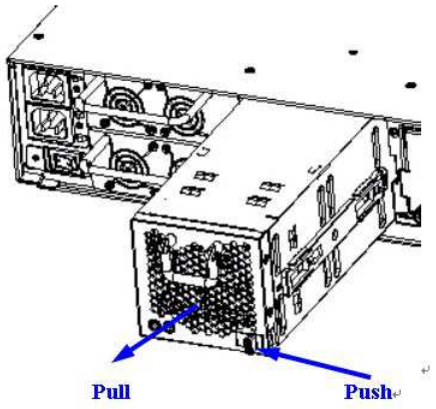
Y3-16S6 & Y3-24S6 Series



Removing the Fan Module from RAID system

Remove the Fan modules by pushing the latch to release the lock of module then slide it back and lifting off.

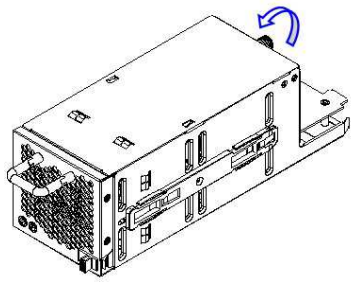
Y3-12S6 Series



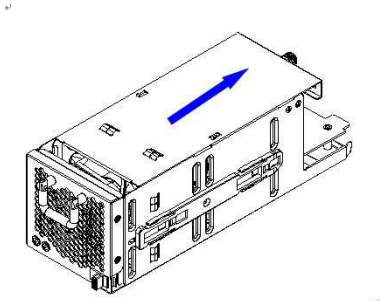
Installing the Fan module into RAID system:

Insert a Fan module into system, the latch will lock the Fan module automatically.

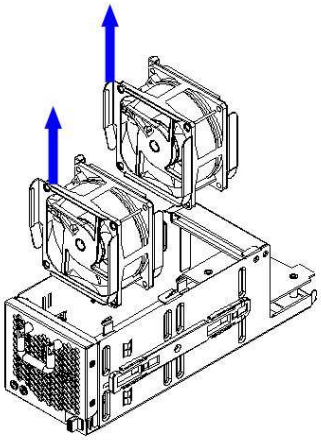
Replacing Fan in a Fan Module:



Step 1: Turn anti-clock wise to release the thumb screw.



Step 2: slide the cover to blue arrow direction .

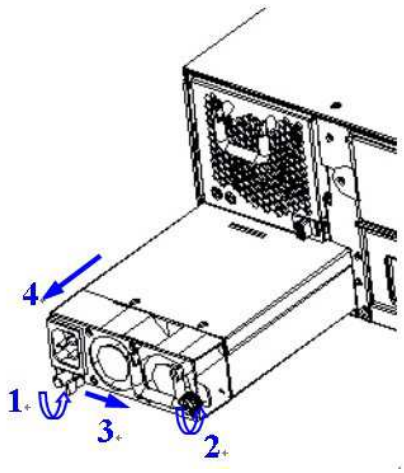


Step 3: Remove the cover of Fan module and lift the Fans.

Hot Swapping to replace the Power Module

This section provides instructions for the removal and installation of the Power Module indicated in the figure below.

Removing the Power Module from RAID system Y3-16/24S6 Series :

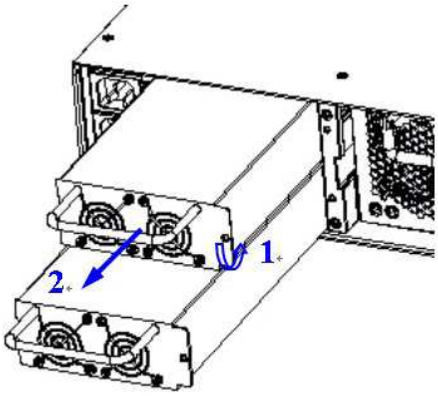


Step1&2: Unscrew the thumb screw.

Step3: Release the latch and hold it at unlock-position.

Step4: Slide it back and lifting off.

Removing the Power Module from RAID system Y3-12S6 Series :



Step1: Unscrew the thumb screw.

Step 2: Slide it back and lifting off.

Installing the Power module into RAID system :

Insert a Power module then fasten the screw.

Note

The Power indicator will turn bright "Green" to indicate it has powered on

Turning on for the first time

When cabling is completed, RAID SYSTEM can be turned on. This should be done in the following order:

1. First turn on the power switch of RAID SYSTEM.

2. Then power on and boot the host computer(s)

When RAID SYSTEM is running, you are ready to configure one or more RAID arrays. You have the following options:

1. **Turn to Chapter 2 of "Software Operation Manual" to perform a quick setup of a single RAID array using the control panel.**
2. **Turn to Chapter 3 of "Software Operation Manual" to access the Monitor Utility. Once the Monitor Utility is accessed, you can perform a Quick Setup (Chapter 2) or complete configuration (Chapter 4) with either the control panel or Monitor Utility.**
3. **Turn to Chapter 4 of "Software Operation Manual" to perform a full configuration using the control panel.**

Turning off

When turning off RAID SYSTEM, users are advised to first shut down the server, then power off RAID SYSTEM.

Restarting

When restarting RAID SYSTEM, users are advised to first restart the server, then power on RAID SYSTEM.

For PCIe-SAS RAID System:

When RAID SYSTEM is turned on, but Host Computer is not yet powered on, LCD will show "Init LSI ROC" and wait for Host Computer starting up. That's normal, when Host Computer starts up, PCIe bus will run up, and PCIe-SAS RAID controller will start to POST and finish power on procedure.

Install the RAID subsystem in a Rack

You are shipped with one rack mounting kit for each RAID subsystem that you intend to rack mount. The RAID subsystem is designed for installation into an industry-standard 19-inch rack mount cabinet. Following the use of this section for installing the RAID subsystem into a Rack

Step1: Assemble and adjust the slide Rails

a. Insert rear slide rail into left (right) slide rail

b. Adjust the length of the slide rails

c. Install P4*8M Screw and M4 NUT as **figure 1**

d. Determine where in the rack, the subsystem is going to be. Install the brackets in the rack. Secure each side of the brackets with two position screws through the front rack posts, and two position screws through the rear rack posts. When the rails can be properly fitted to the rack posts, Fasten the screws.

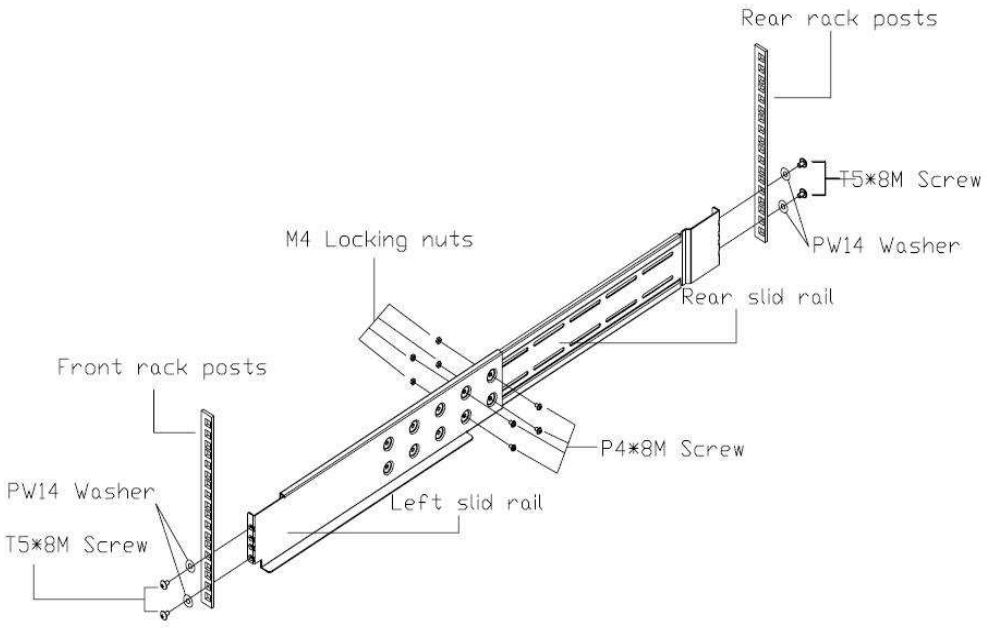


Figure 1: Assembly Slid rail and rack posts

Step 2 : Install Clip nuts

Attach M5 clip nut on each side of the front rack posts.

Clip nuts use the figure 2 below to locate the clip nuts.

Note:

These clip nuts will be used to secure the subsystem through its front ears as will be discussed in Step 4.

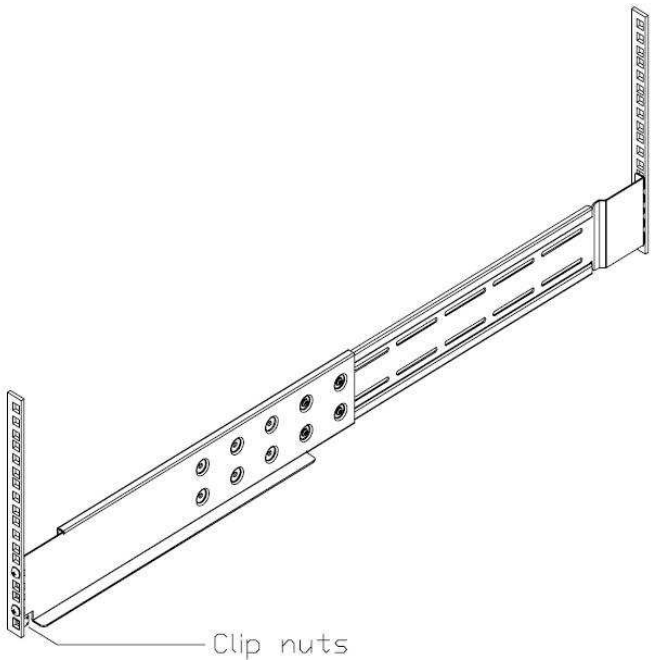


Figure 2: Attach the clip nuts to the rack posts

Step 3 : Slide the subsystem into the server rack

Lift the subsystem enclosure and slide it slowly and gently along the slide rail into the rack.

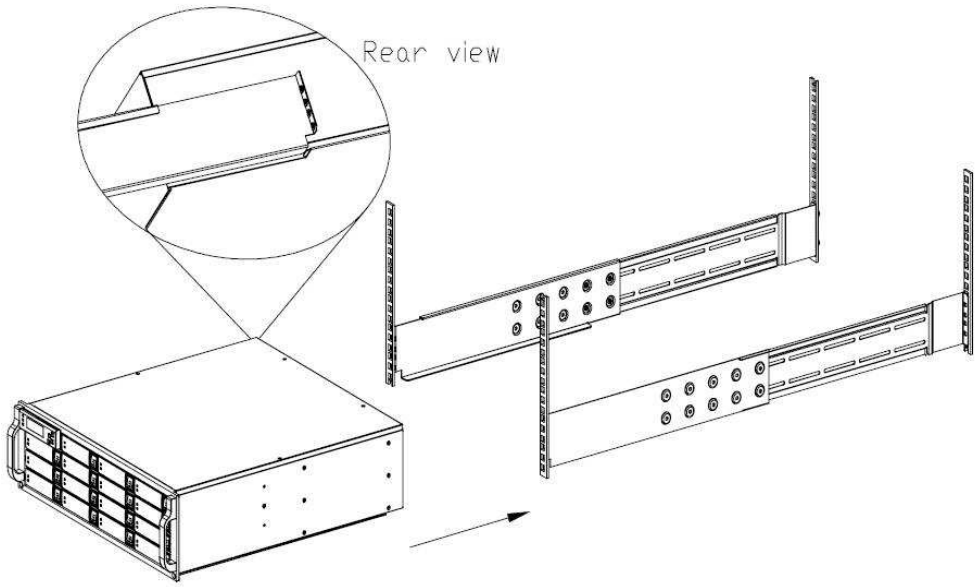


Figure 3: Slide the subsystem into the server rack

Step 4 : Secure the subsystem in the server rack

Fasten two M5 screws through the chassis ears in the front side of the chassis.

The RAID subsystem should now be securely mounted into the rack.

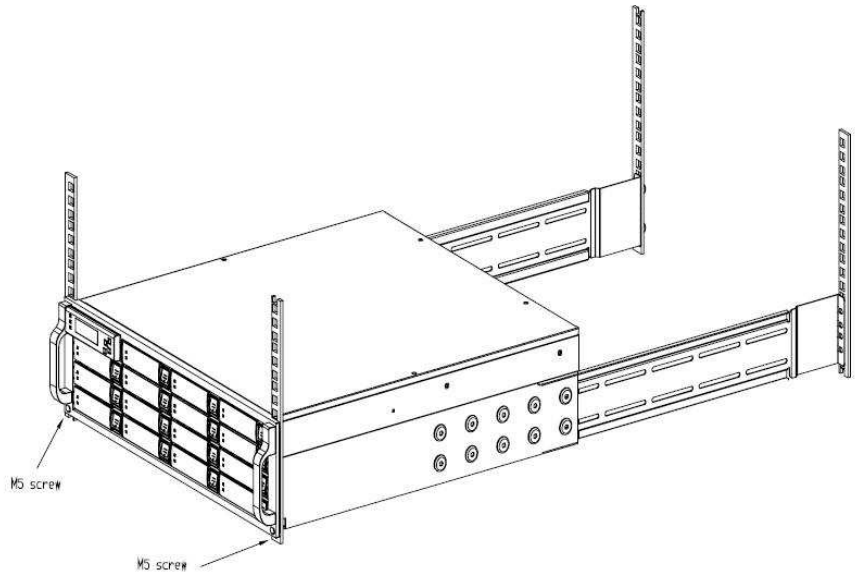


Figure 4: Secure the subsystem in the server rack

Install the RAID subsystem into the Rack Cabinet

1. Lift the RAID subsystem (one person on each side of the RAID system) and approach the rack with the button-back of the RAID subsystem facing the end of Slide rails.
2. Slide the RAID subsystem evenly all the way into the rack cabinet.
3. Using the rack mount screws, secure the top and bottom of the RAID subsystem to the rack frame.

Caution

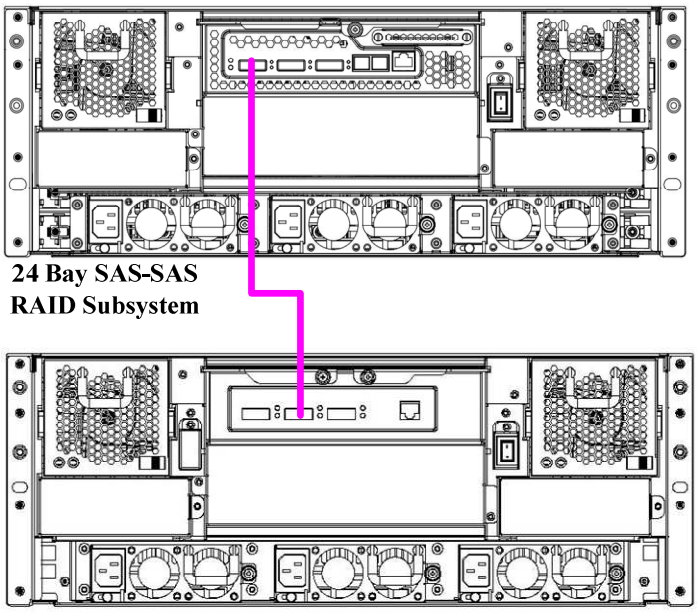
The RAID subsystem is heavy; two people are required to move the system in the procedure.

Appendix A

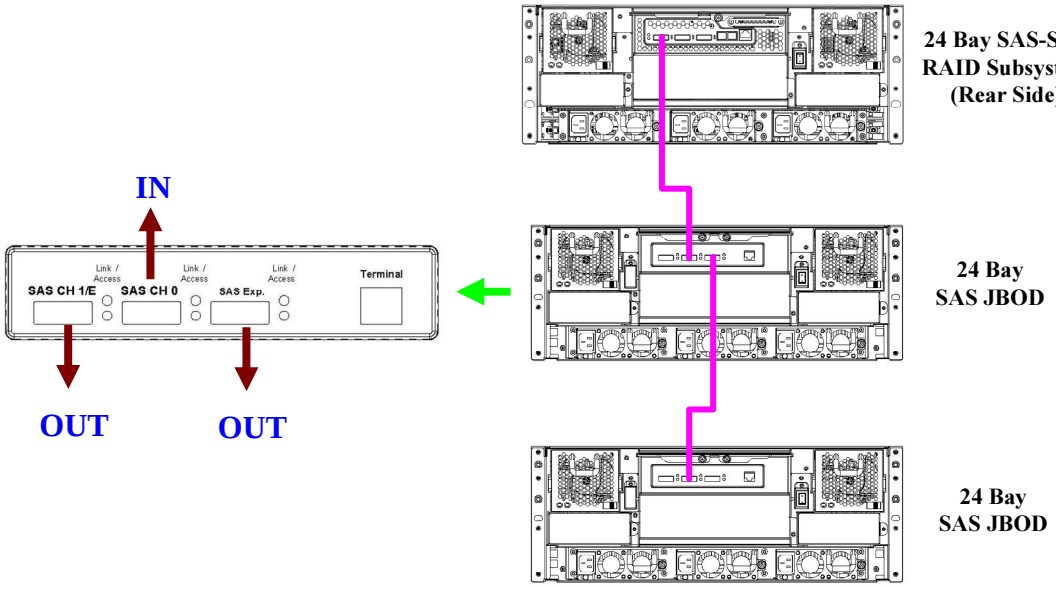
How to deploy the SAS JBOD with Yotta 3 SAS Raid

There are many topologies of SAS JBOD with Yotta 3 SAS Raid.
Ways to implement are as below:

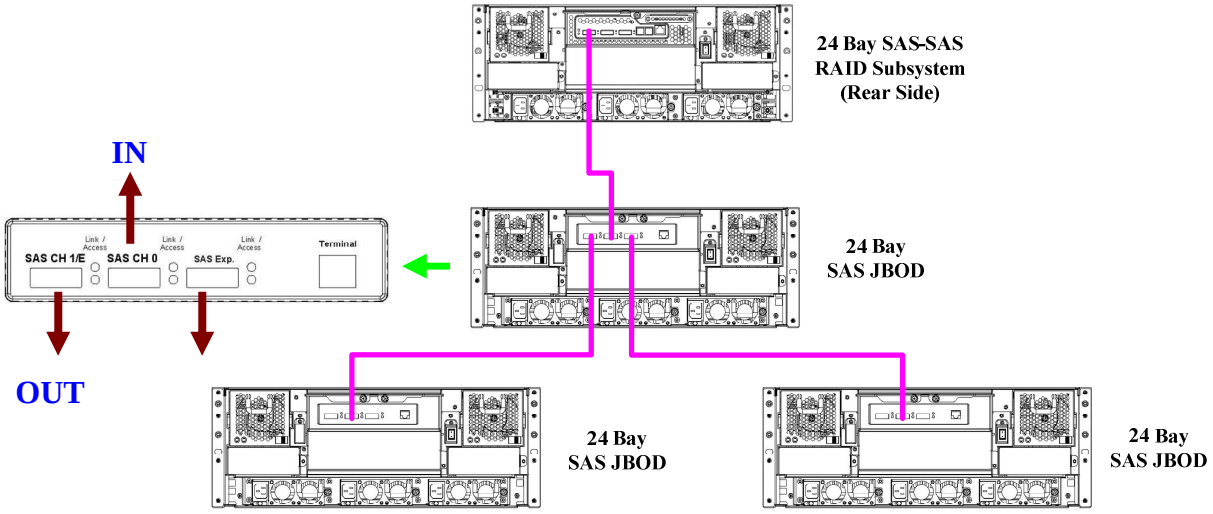
One SAS Raid subsystem with one SAS JBOD



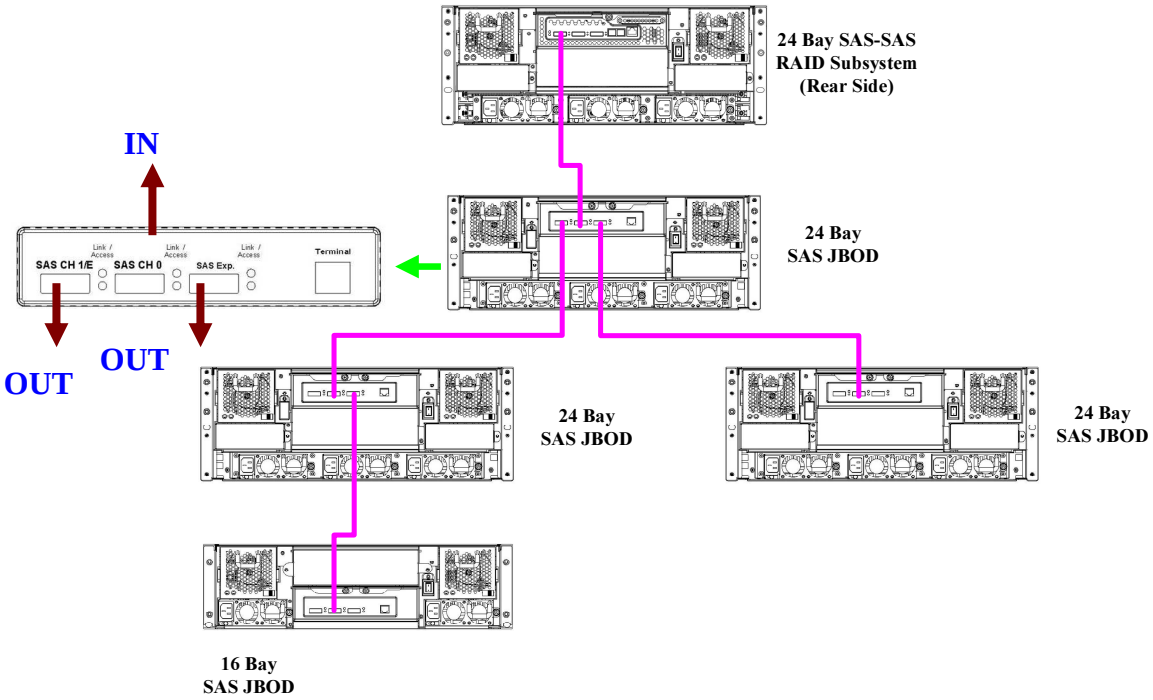
One SAS Raid subsystem with two SAS JBOD



One SAS Raid subsystem with three SAS JBOD



One SAS Raid subsystem with four SAS JBOD



It supports up to four tiers and 122 SAS/SATAII peripheral devices (SAS/SATA HDDs + Raid Enclosures) by using SAS expanders.

- One Volume Set supports up to 32 HDDs
- One SAS Raid subsystem supports up to 128 Volumes
- One SAS Raid subsystem supports up to 122 SAS/SATAII peripheral devices (SAS/SATA HDDs + Raid Enclosures) by using SAS expanders.

There are four tiers within JBOD topology as above:

- First tier is a RAID System.
- Second tier is a SAS JBOD with a SAS CH0 on it. Connecting SAS CH0 to SAS exp. Port on RAID System via a Mini SAS to Mini SAS Cable.
- Third tier could be two SAS JBODs with a SAS CH0 port individually. One is connected to the SAS EXP. Port on the second tier SAS JBOD via a Mini SAS to

Mini SAS Cable. Another is connected to the SAS CH1/E Port on the second tier SAS JBOD.

- Fourth tier is a SAS JBOD with a SAS CH0 on it. Connecting SAS CH0 to SAS exp. Port on third tier SAS JBOD via a Mini SAS to Mini SAS Cable.

Note

It is often recommended to install the hard drive with same brand, model no., interface and capacity in this RAID subsystem.

Due to hard drives spin at different speed and it may lead to compatible issue or performance decline. So we do not recommend users to install SAS and SATA hard drive meantime in an enclosure.

RAID members need to be included at the same enclosure which means you need to create array in the same enclosure. If RAID members are created from two or more different enclosures, there would be some risks (for example: if a mini-SAS cable gets problem, RAID members from different enclosure will be lost, volume sets belong to this Array may be failed. Shutdown RAID and JBOD to fix cable problem, after that, turn on JBOD and RAID system again and controller will get array back, but in some case it may not get the array back)

Turning on for the first time

When cabling is completed, SAS RAID system + SAS JBOD system can be turned on. This should be done in the following order:

1. First turn on the power switch of "SAS JBOD" system.

2. Then turn on the power switch of "SAS RAID" system

3. Power on and boot the host computer(s)

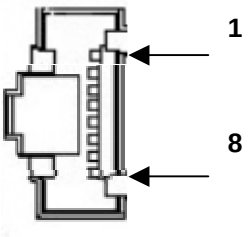
Turning off

When turning off SAS RAID system + SAS JBOD system, users are advised to first shut down the server, then power off SAS RAID SYSTEM ,finally power off SAS JBOD SYSTEM.

Appendix B

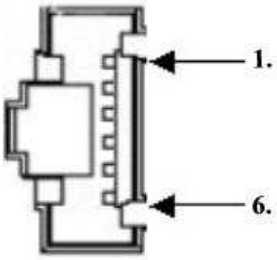
Connectors

Ethernet RJ-45 Connector



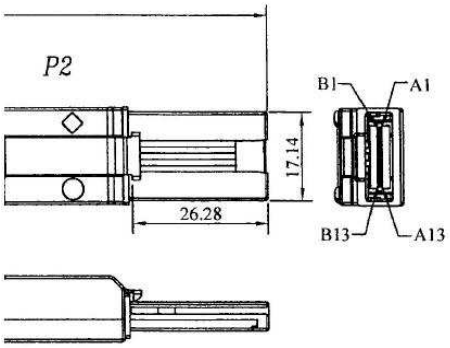
Pin#	Signal Name
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

RJ-11 RS-232



Pin#	Signal	Pin#	Signal
1	NC	6	NC
2	GND		
3	RX		
4	TX		
5	CTS		

Mini-SAS cable Connector



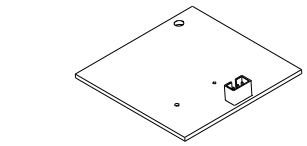
Pin#	Signal Name	Pin#	Signal Name
A1	GND	B1	GND
A2	RX0+	B2	TX0+
A3	RX0-	B3	TX0-
A4	GND	B4	GND
A5	RX1+	B5	TX1+
A6	RX1-	B6	TX1-
A7	GND	B7	GND
A8	RX2+	B8	TX2+
A9	RX2-	B9	TX2-
A10	GND	B10	GND
A11	RX3+	B11	TX3+
A12	RX3-	B12	TX3-
A13	GND	B13	GND

Appendix C

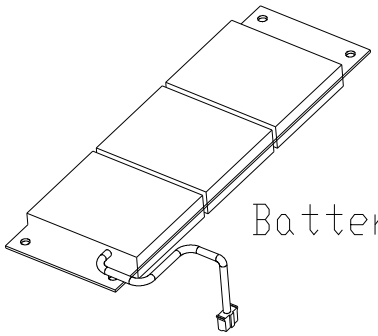
Battery Backup Module (BBM)

The external RAID controller operates using cache memory .The battery Backup Module is an add-on module that provides power to the external RAID controller cache memory in the event of a power failure. The Battery Backup Module monitors the write back cache on the external RAID controller, and provides power to the cache memory if it contains data not yet written to the hard drives when power failure occurs.

BBM Components



Battery Board
(ARC-8006-2)



Battery Pack

BBM Specifications:

Mechanical

Battery Board Dimension (W x H x D) : 45 x 14 x 54 mm
Battery pack Dimension (W x H x D) : 50 x 10 x 147 mm

Battery pack Connector

3 x Pins Connector

Input Voltage

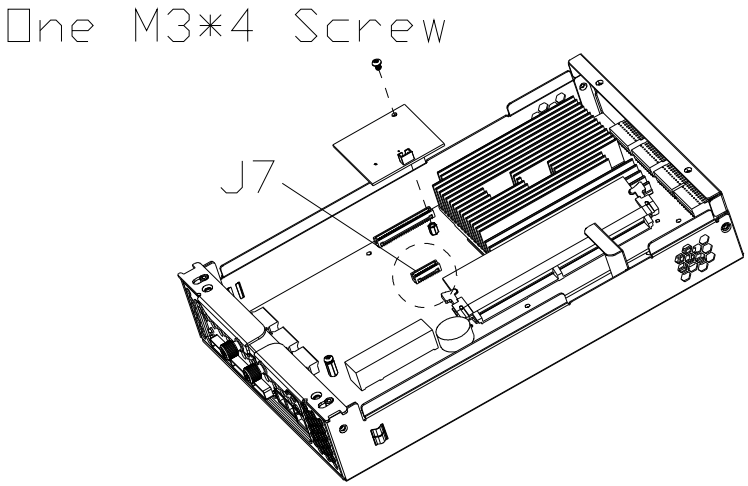
+3.6 VDC

On Board Battery Capacity

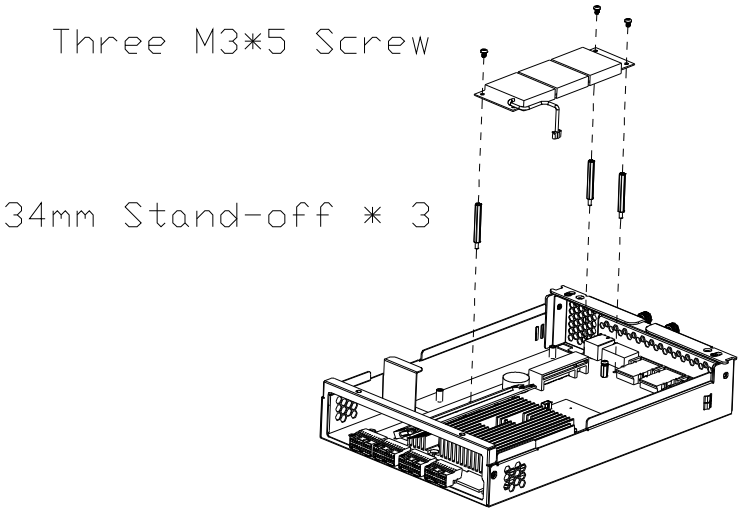
3000MAH (3*1000MAH)

BBM Installation Procedures (Y3-12S6E & Y3-16S6E)

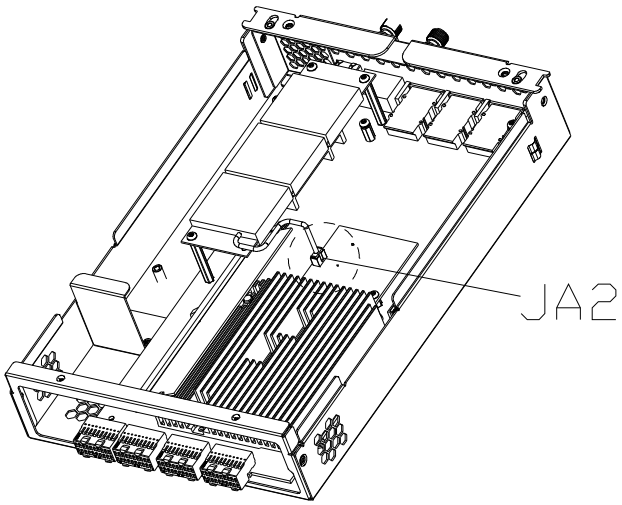
- ⌘ Make sure all power to the system is disconnected.
- ⌘ Use screw driver to release Controller's top cover screw and take off top cover.
- ⌘ Install Battery Board(ARC8006-2) pin connector into Controller J7 connector,J7 connector location is shown as in bellow :



- ⌘ Install three 34mm Stand-off and Battery pack on stand-off as in bellow:



- ⌘ Insert Battery pack 3 pin connector into Battery Board (ARC8006-2) JA2 connector, JA2 location shown as in bellow:
- ⌘ Put back the top cover of the Controller module



4U RAID system please check "BBM Installation Procedures V1.0.pdf"
(Y3-24S6E)

Note: PCIe-SAS Controller's 3 pin BBM connector is **JP1**

Battery Backup Capacity

Battery backup capacity is defined as the maximum duration of a power failure for which data in the cache memory can be maintained by the battery. The BBM's backup capacity varied with the memory chips that installed on the external RAID controller.

Capacity	Memory Type	Battery Backup duration(Hours)
1GB Memory	Normal	150
2GB Memory	Normal	100

Operation

⌘ Battery conditioning is automatic. There are no manual procedures for battery conditioning or preconditioning to be performed by the user.

⌘ In order to make sure all the capacity is available for your battery cells, allow the battery cell to be fully charged when installed for the first time. The first time charge of a battery cell takes about 24 hours to be fully charged.

Removing the Battery Backup Module

The battery module will need to be removed for one of the following reason:

⌘ Disconnect battery module if there is a long storage period before deployment

⌘ The LI-ION battery will no longer accept a charge properly.

Appendix D

Specifications

Y3-24S6EPE/Y3-16S6EPE/Y3-12S6EPE

Model	Y3-24S6EPE	Y3-16S6EPE	Y3-12S6EPE
Number of RAID controller	**1**		
RAID CPU Engine	LSI 800MHz RAID-on-Chip (ROC) processor		
Cache Support (Write back)	Up to 4GB 240pins DDR2-800 with ECC registered SDRAM Memory using x8 or x16 chip organization		
RAID Levels	0, 1,10(1E), 3, 5 , 6, 30, 50 ,60 & JBOD		
RAID Features	Multiple RAID selections Online array roaming Offline RAID set Online RAID level / stripe size migration Online capacity expansion and RAID level migration simultaneously Online volume set growth Support global and local hot spare Instant availability and background initialization Automatic drive insertion / removal detection and rebuilding. Greater than 2TB per volume set (64-bit LBA support), Greater than 2TB per disk drive Disk scrubbing / array verify scheduling for automatic repair of all configured RAID sets Login record in the event log with IP address and service (http, telnet and serial) Support NTP protocol to synchronize RAID controller clock over the on-board LAN port Max 122 devices Max 128 LUNs (Volume set)		
System Type	4U Rack-Mount	3U Rack-Mount	2U Rack-Mount
Host Interface	PCIe 8X		
Disk Interface	SAS 6Gb / SATA 6Gb		
Disk Channel	24 Bay Disk Channel	16 Bay Disk Channel	12 Bay Disk Channel
JBOD Expansion Port	Single Mini SAS JBOD Expansion Port can be attached to SAS JBOD to expand capacity		
Battery Backup Module	supporting 72 hours battery backup time(Optional)		
Hot Swap Components	Power Supply, FAN, Disk Drive,		
RAID Management	Firmware embedded Web browser-based RAID manager via built-in 10/100 Ethernet port Firmware embedded manager via McBIOS (for PCIe RAID only) Firmware embedded manager through LCD control panel Field-upgradeable firmware from flash ROM		
Monitors & Notifications	All system status can be monitored via Firmware-embedded Web browser-based RAID manager System status indication through LCD, LED and alarm buzzer All system events can be sent to multiple user via emails alerts SNMP agent already embedded in the firmware allows remote to monitor events through LAN		
Operating Systems	Windows, Mac OS, Linux, Solaris, FreeBSD		
Power Supply	24 bays systems: Redundant by three 460W power modules with PFC feature, loading sharing type and cable-less design	16 bays systems: Redundant by dual 460W power modules with PFC feature, loading sharing type and cable-less design	12 bays systems: Redundant by dual 375W power modules with PFC feature, loading sharing type and cable-less design
Electrical	AC Voltage 110-230 VAC Ac Frequency 50-60Hz		
Temperature	Operating Temperature: 5 to 35 degree C. Non Operating Temperature: -40 to 60 degree C.		
Relative Humidity	20% to 80% non-condensing		
Dimensions	446.6mm(W)*560mm(D)*4U(H)	446.6mm(W)*560mm(D)*3U(H)	446.6mm(W)*545mm(D)*2U(H)

Y3-24S6ES6/Y3-16S6ES6/Y3-12S6ES6

Model	Y3-24S6ES6	Y3-16S6ES6	Y3-12S6ES6
Number of RAID controller	**1**		
RAID CPU Engine	LSI 800MHz RAID-on-Chip (ROC) processor		
Cache Support (Write back)	Up to 4GB 240pins DDR2-800 with ECC registered SDRAM Memory using x8 or x16 chip organization		
RAID Levels	0, 1,10(1E), 3, 5 , 6, 30, 50 ,60 & JBOD		
RAID Features	Multiple RAID selections Online array roaming Offline RAID set Online RAID level / stripe size migration Online capacity expansion and RAID level migration simultaneously Online volume set growth Support global and local hot spare Instant availability and background initialization Automatic drive insertion / removal detection and rebuilding. Greater than 2TB per volume set (64-bit LBA support), Greater than 2TB per disk drive Disk scrubbing / array verify scheduling for automatic repair of all configured RAID sets Login record in the event log with IP address and service (http, telnet and serial) Support NTP protocol to synchronize RAID controller clock over the on-board LAN port Max 122 devices Max 128 LUNs (Volume set)		
System Type	4U Rack-Mount	3U Rack-Mount	2U Rack-Mount
Host Interface	Dual Mini SAS ports(8088) per controller		
Disk Interface	SAS 6Gb / SATA 6Gb		
Disk Channel	24 Bay Disk Channel	16 Bay Disk Channel	12 Bay Disk Channel
JBOD Expansion Port	Single Mini SAS JBOD Expansion Port can be attached to SAS JBOD to expand capacity		
Battery Backup Module	supporting 72 hours battery backup time(Optional)		
Hot Swap Components	Power Supply, FAN, Disk Drive,		
RAID Management	Firmware embedded Web browser-based RAID manager via built-in 10/100 Ethernet port Firmware embedded manager via RS-232 port Firmware embedded manager through LCD control panel Field-upgradeable firmware from flash ROM		
Monitors & Notifications	All system status can be monitored via Firmware-embedded Web browser-based RAID manager System status indication through LCD, LED and alarm buzzer All system events can be sent to multiple user via emails alerts SNMP agent already embedded in the firmware allows remote to monitor events through LAN		
Operating Systems	O/S Independent and Transparent		
Power Supply	24 bays systems: Redundant by three 460W power modules with PFC feature, loading sharing type and cable-less design	16 bays systems: Redundant by dual 460W power modules with PFC feature, loading sharing type and cable-less design	12 bays systems: Redundant by dual 375W power modules with PFC feature, loading sharing type and cable-less design
Electrical	AC Voltage 110-230 VAC Ac Frequency 50-60Hz		
Temperature	Operating Temperature: 5 to 35 degree C. Non Operating Temperature: -40 to 60 degree C.		
Relative Humidity	20% to 80% non-condensing		
Dimensions	446.4mm(W)*560mm(D)*4U(H)	446.4mm(W)*560mm(D)*3U(H)	446.4mm(W)*545mm(D)*2U(H)

Y3-12S6EF8

Model	Y3-12S6EF8
Number of RAID controller	1
RAID CPU Engine	LSI 800MHz RAID-on-Chip (ROC) processor
Cache Support (Write back)	Up to 4GB 240pins DDR2-800 with ECC registered SDRAM Memory using x8 or x16 chip organization
RAID Levels	0, 1,10(1E), 3, 5 , 6, 30, 50 ,60 & JBOD
RAID Features	Multiple RAID selections Online array roaming Offline RAID set Online RAID level / stripe size migration Online capacity expansion and RAID level migration simultaneously Online volume set growth Support global and local hot spare Instant availability and background initialization Automatic drive insertion / removal detection and rebuilding. Greater than 2TB per volume set (64-bit LBA support), Greater than 2TB per disk drive Disk scrubbing / array verify scheduling for automatic repair of all configured RAID sets Login record in the event log with IP address and service (http, telnet and serial) Support NTP protocol to synchronize RAID controller clock over the on-board LAN port Max 122 devices Max 128 LUNs (Volume set)
System Type	2U Rack-Mount
Host Interface	Quad FC 8Gb port per controller
Disk Interface	SAS 6Gb / SATA 6Gb
Disk Channel	12 Bay Disk Channel
JBOD Expansion Port	Dual Mini SAS JBOD Expansion Port can be attached to SAS JBOD to expand capacity
Battery Backup Module	supporting 72 hours battery backup time(Optional)
Hot Swap Components	Power Supply, FAN, Disk Drive,
RAID Management	Firmware embedded Web browser-based RAID manager via built-in 10/100 Ethernet port Firmware embedded manager via RS-232 port Firmware embedded manager through LCD control panel Field-upgradeable firmware from flash ROM
Monitors & Notifications	All system status can be monitored via Firmware-embedded Web browser-based RAID manager System status indication through LCD, LED and alarm buzzer All system events can be sent to multiple user via emails alerts SNMP agent already embedded in the firmware allows remote to monitor events through LAN
Operating Systems	OS independent and transparent (PCIe Raid needs drivers)
Power Supply	12 bays systems: Redundant by dual 375W power modules with PFC feature, loading sharing type and cable-less design
Electrical	AC Voltage 110-230 VAC Ac Frequency 50-60Hz
Temperature	Operating Temperature : 5 to 35 degree C. Non Operating Temperature : -40 to 60 degree C.
Relative Humidity	20% to 80% non-condensing
Dimensions	446.4mm(W)*545mm(D)*2U(H)

Note

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